XI. *An Account of a Storm of Salt, which fell in January*, 1803. By Richard Anthony Salisbury, Esq. F.R.S. and L.S.

Read February 5, 1805.

Perhaps there never was any period, gentlemen, in which the science of natural history, in all its various branches, received such ample additions, and solid improvements, as during the few years that you have associated for the purpose of promoting it. How rare and valuable your several communications have been, appears from the very high character your Transactions now universally hold, and which allows me to indulge the pleasing fancy, that the genius of that immortal master whose name we are distinguished by, will still hover round us. Professor Swartz, in his Prodromus, has taken a very appropriate motto from the sacred writings, and flatters this country so far as to use the English translation. *Many shall run to and fro, and knowledge shall abound*, is the passage he quotes; but the extraordinary fact which I have now to relate to you, proves that something is yet to be learnt at home.

On the 14th of *January*, 1803, I observed an east window of my house, which had been cleaned a few days before, covered on the outside with an apparent hoar frost. When the servant who was sent to remove it, came and told me it was *salt*, I was astonished, and still more so, upon going out, to find this substance almost as abundantly deposited in the garden and neighbouring fields. I was totally at a loss to account for so curious

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and unusual a phænomenon, and the next morning, with my gun in my hand, I walked over a circuit of twenty miles, before I ventured to trust the evidence of two of my senses, and bring some branches from the hedges, still salt, to Sir Joseph Banks. He immediately removed most of my difficulties, by suggesting that this *salt* must have been taken up from the sea by the gale of wind, which had blown with great force from the east during most of the preceding week, and he honoured me with his command diligently to examine the effects of this storm upon vegetation the ensuing year: the following are such observations as I was able to make.

The garden at Mill Hill is well sheltered from the east: of course less damage happened to the trees and shrubs in it, than in many that were more exposed. The *Cedars of Libanus* suffered considerably: in one near the house, all the branches on the east side became brown, and continued so till the middle of *May*, when they put forth their new verdure very sparingly, the ends of a great number being entirely destroyed. The *Cembra Pines* and *Pinasters* also looked more than usually brown, losing their old foliage earlier in the summer. Near Hendon there is a row of *Weymouth Pines* and *Spruce Firs*, from 50 to 60 feet high, planted alternately in a rich deep soil: though this spot is particularly sheltered from the east by the opposite woods, the branches of *Weymouth Pines* on that side were defoliated from the bottom to the top, while the *Spruce Firs* remained uninjured. The *Scotch Fir*, when exposed to the full force of this wind, appeared not exempt from damage, and this was no where more conspicuous than upon Hounslow-Heath; but what is remarkable, some of the clumps there wholly escaped, although no obvious reason occurs from their situation, why they should not all have suffered alike. The *Portugal Laurel* seems the next evergreen

green materially injured by this *Salt Wind*, all the leaves exposed to it being more or less scorched, and in some places even the tops of the branches mortified. The *Furze* of our commons, if I may judge from the east side being invariably most decayed, is also affected by it, yet I saw this plant in abundance in Devonshire and Cornwall, where it must perpetually be exposed to such blasts.

The farthest place to the westward that I visited the following summer was Bulstrode, where many of the trees had suffered severely: from thence to the mouth of the Thames, the last place where this wind could have taken up any salt spray, cannot be a less distance than seventy miles. In travelling through part of Essex so late as *September*, the effect of the *Salt Wind* was still more and more evident as the sea was approached. About South End, I was told the *Hollies* had been nearly defoliated, and even the *Oaks* and *Ashes* then appeared to have fewer leaves on their east than west sides. The *Laurustinusses* generally seemed burnt as if by fire, with scarce any symptoms of vegetation in their upper branches. I looked in vain for the *Bay-tree* during my whole ride.

As for the more tender esculent vegetables, few escaped; the first crop, of *Peas*, *Beans*, *Early Radishes*, and young *Lettuces*, being generally destroyed. Of our garden flowers, *Ranunculusses* instantly perished; but their relations in natural affinity, *Winter Aconites* and *Anemonies*, as I have since had an opportunity of remarking, are not at all affected by this wind. *Snowdrops*, *Crocusses*, *Hyacinths*, and *Narcissusses* are also insensible of its influence. Those plants that flourish near the sea were naturally protected. The beautiful *Cypress*, *Red Cedar*, *Evergreen Oak*, *Arbutus*, *Myrtle*, *Phillyrea*, *Alaternus*, *Rosemary*, *Lavender*, and, I believe, *Laurel* are of this number. *Wheat* also escaped,

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which it is well known thrives in fields immediately open to the sea.

I do not find that any account of these *Salt Winds* has been hitherto recorded, yet I fear they visit us annually. Last year, 1804, I again observed one on the 11th and 12th of *February*, while at Norwich with our President: this also reached Middlesex, most of the *Peas* which had previously survived the cold of 14 degrees of Fahrenheit's thermometer, being on those nights cut off under a much higher temperature.

That it is the *Salt* merely, and not the *Cold*, which produces these deleterious effects upon so great a number of vegetables, is fully confirmed by a similar wind noticed by Sir Joseph Banks, some years ago, in Lincolnshire: it was early in *September*, and blew very steadily for four or five days due east, when every leaf on that side of the trees and hedges became brown. Were a wind thus loaded with the spray of salt-water to blow during the months of *May* and *June*, when vegetation is in activity, it is difficult to calculate the extent of the mischief it would occasion. All persons who have had the care of plants at sea, know that, whenever the wind is strong enough to turn over the tops of the waves into what the sailors call *White Caps*, it is necessary to keep the plants closely covered up, the air being then so impregnated with salt, that, if they be only a short time exposed to it, they will perish.

To the above account I wish I could add any satisfactory explanation of the manner in which *Sea Salt* acts upon the texture of vegetables. Is it by stopping the pores of the leaves, and preventing perspiration? Can the wax which covers so many maritime plants with a fine glaucous hue, or the woolly pubescence so conspicuous upon a still greater number, con-

tribute to preserve them from the external action of the salt? Is there any analogy between the modes in which salt acts when applied externally to vegetables, and the more imperfect animals, such as slugs and worms? Future observations and judicious experiments will probably throw great light on this matter.